COMPUTERIZED NETWORK ORGANIZATION DESIGN FOR CLINICAL PATIENT DATA MANAGEMENT OF A CARDIOLOGY DEPARTMENT

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We developed a computerized network organization design for clinical patient data management of a cardiology Department. On line clinical summary data base is available from each work-station, including demographic data, diagnostic coding, summary of relevant clinical and diagnostic procedures, access indices to complete records (paper, videotapes, cinefilm, etc.). Each work-station (PC Olivetti with original Dbase III and Basic software) is available for data entry and retrieval, local memory, production and printing of clinical reports, upgrading of clinical summary data base. Present network organization is achieved by using commercial TenNet software, connecting 4 work-stations: Echo Lab., Cath Lab., Pacemaker clinic, Electrophysiology.

Data on 8500 patients are stored and available on line from each work-station.

This organization allows to obtain assential on line clinical data on a large number of patients, while detailed information can be reached by complete records.

STATISTICAL REPORT GENERATION FROM A CARDIAC SURGERY DATABASE

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The University of Toronto has maintained a prospective cardiac surgery database since 1982. We have employed the database to provide quality assurance and to evaluate changing trends in patient presentation. We have collected the information required to assess the predictors of early and late mortality and morbidity after coronary bypass and valve surgery. Our definitions conform to the recently adopted guidelines recommended by the Thoracic Surgery Societies. Recently we have developed a program which will generate a summary report of statistical information from a cardiac surgery database.

The program automates our previously established reporting protocol and works with minimal user intervention. A string of commands integrates dBaseIV and SAS software for the IBM compatible PC and with SAS on a university mainframe.

1. A menu screen is used to select the time interval, variables, and statistical procedures.
2. Records are extracted and sent to SAS for PC using a dBaseIV language program.
3. The dBaseIV data set is converted into a SAS legible set using a SAS language program.
4. Statistics are computed in SAS for PC.
5. More complicated analysis is done by transferring the SAS data set via modem link to the mainframe version of SAS. The session runs from the PC and downloads results directly onto the PC.
6. Results are written to an ASCII text file and copied into a word processing document.

In summary, we have developed a unique database employing the definitions required to assess early and late postoperative morbidity and mortality. We have also developed a program which generates reports of the data and facilitates statistical analysis.

THE MERCY HOSPITAL HEART CENTER COMPUTER SYSTEM PROJECT: STRUCTURE AND APPLICATION

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The Mercy Hospital Heart Center Computer System Project (MHHCCSP) was initiated in order to answer deficiencies in currently available systems designed to manage cardiovascular patients and patient data. MHHCCSP is a broadly based data management and expert system that provides a unique configuration of central primary storage and distributed secondary storage with a data structure and knowledge base that is invisible to the end user. The system allows transparent access to medial records, electronic medical chart, discharge summaries, histories and physicals, and highly detailed data on cardiovascular patients. MHHCCSP is fully interdepartmental and in this sense represents an integrated medical system versus separate departmental systems that dominate the hospital data system market. The single software program covers all areas of cardiovascular patient management. From a research standpoint any data items stored anywhere on the system can be searched, sorted and compared at multiple levels without programming using a simple icon-drive interface. MHHCCSP has been used to generate several published studies including (i) a randomized prospective comparison of left internal mammary artery versus saphenous vein graft in patients receiving coronary artery bypass surgery at Mercy Hospital Medical Center, (ii) an analysis of the results of PTCA performed with different angioplasty balloons where one certain balloon was found to have a 40 times higher incidence of rupture.

POSTOPERATIVE CARDIOPULMONARY MONITORING WITH A COMPUTER-BASED SYSTEM

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A computer-based system detects cardiopulmonary alterations in postoperative cardiac patients (pts). Pts are on-line monitored by a data management system with simultaneous acquisition (every 30 seconds) of 11 cardiopulmonary variables: heart rate, mean arterial pressure (press), pulmonary artery press, left and right atrial press, respiratory rate, minute ventilation,peak inspiratory and plateau press, end tidal CO2 and minute CO2 production. The system is connected with a blood gas analyzer allowing the acquisition of both arterial and mixed venous pH, partial O2 and CO2 press, HCO3, Hb saturation and O2 content. For each blood gas obtained, the system automatically records the cardiopulmonary data. Using the on-line data, the system at predetermined intervals presents the following 12 measured and calculated variables reflecting cardiopulmonary performance: temperature, Hb, arterial blood base excess, partial O2 press in the mixed venous blood, arteriovenous O2 difference, heart rate, left atrial press, mean arterial press, minute CO2 production index, cardiac index, left ventricular stroke work index and O2 delivery. Cluster analysis techniques within the system are applied to these data in order to identify deviations from normal cardiopulmonary state. The pattern and severity of deviations from normal recovery are quantified at each predetermined interval, therefore allow proper intervention.